

IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

Claims 1-5 (canceled).

6. (previously presented) A storage system comprising:
 - a storage controller for controlling the storage system; and
 - at least one disk device for storing data from said storage controller,
 - wherein said storage controller comprises:
 - a channel controller for receiving a file access input/output (I/O) writing request based on a file-name indication, writing data from an information processing device through a network and outputting a block access I/O write request corresponding to the file access I/O writing request,
 - a disk controller for writing the writing data into a storage volume in which data are stored based on the block access I/O write request,
 - a first memory including a cache memory for temporarily storing the writing data transmitted/received between the channel controller and the disk controller, and
 - a data transfer network connected to said channel controller, said disk controller and said first memory,
 - wherein the channel controller contains a first processor for outputting the block access I/O write request corresponding to the file access I/O writing request and controlling the first memory, a file access circuit which has a second processor and a second memory controlled by the second processor and serves to receive the file access I/O writing request and the writing data

from the information processing device, a data transfer device for controlling the data transfer between the first memory and the second memory, and a third memory controlled by the first processor, which are formed on a circuit module, and

wherein the first processor writes into the third memory first data transfer information containing information indicating the storage position of the writing data in the first memory, the second processor writes into the second memory second data transfer information containing information indicating the storage position of the writing data in the second memory and transmits information indicating the storage position of the second data transfer information to the first processor, the first processor transmits the data transfer device transfer start information containing information indicating the storage position of the first data transfer information and information indicating the storage position of the second data transfer information, the data transfer device reads out the second data transfer information from the second memory based on the transfer start information, reads out the first data transfer information from the third memory based on the transfer start information and transfers the writing data from the second memory to the first memory based on the first data transfer information and the second data transfer information, and the disk controller writes into the storage volume the writing data stored in the first memory on the basis of the write request.

7. (previously presented) A storage system comprising:
 - a storage controller for controlling the storage system; and
 - at least one disk device for storing data from said storage controller,

wherein said storage controller comprises:

a channel controller for receiving a file access input/output (I/O) read-out request based on a file-name indication from an information processing device through a network, transmitting to the information processing device read-out data read out from a storage volume for storing data and outputting a block access I/O read request corresponding to the file access I/O read-out request,

a disk controller for reading out the read-out data from the storage volume based on the block access I/O read request,

a first memory including a cache memory for temporarily storing the read-out data transmitted/received for the storage volume between the channel controller and the disk controller, and

a data transfer network connected to said channel controller, said disk controller and said first memory,

wherein the channel controller comprises a first processor for outputting the block access I/O read request corresponding to the file access I/O read-out request and controlling the first memory, a file access circuit which has a second processor and a second memory for controlling the second processor and receives the file access I/O read-out request from the information processing device, a data transfer device for controlling the data transfer between the first memory and the second memory, and a third memory controlled by the first memory, which are formed on a circuit board, and

wherein the disk controller writes into the first memory the read-out data read out from the storage volume based on the read request, the first

processor writes into the third memory first data transfer information containing information indicating the storage position of the read-out data in the first memory, the second processor writes into the second memory second data transfer information containing information indicating the storage position of the read-out data in the second memory and transmits information indicating the storage position of the second data transfer information to the first processor, the first processor transmits to the data transfer device transfer start information containing information indicating the storage position of the first data transfer information and information indicating the storage position of the second data transfer information, the data transfer device reads out the second data transfer information from the second memory based on the transfer start information, reads out the first data transfer information from the third memory based on the transfer start information and transfers the read-out data from the first memory to the second memory on the basis of the first data transfer information and the second data transfer information , and the second processor transmits the read-out data stored in the second memory to the information processing device.

Claims 8-12 (canceled).

13. (previously presented) A control method for a storage system including a storage controller for controlling the storage system; and at least one disk device for storing data from said storage controller, wherein said storage controller comprises:

a channel controller for receiving a file access input/output (I/O) writing request based on a file-name indication, writing data from an information processing device through a network and outputting a block access I/O write request corresponding to the file access I/O writing request, a disk controller for writing the writing data into a storage volume in which data are stored based on the block access I/O write request output by said channel controller, a first memory including a cache memory for temporarily storing the writing data transmitted/received between the channel controller and the disk controller, and a data transfer network connected to said channel controller, said disk controller and said first memory, the channel controller being equipped with a first processor for outputting the block access I/O write request corresponding to the file access I/O writing request and controlling the first memory, a file access circuit which has a second processor and a second memory controlled by the second processor and serves to receive the file access I/O writing request and the writing data from the information processing device, a data transfer device for controlling the data transfer between the first memory and the second memory, and a third memory controlled by the first processor, which are formed on a circuit module, said control method comprising the steps of:

writing, by the first processor, into the third memory first data transfer information containing information indicating the storage position of the writing data in the first memory;

by the second processor, writing into the second memory second data transfer information containing information indicating the storage position of the writing data in the second memory, and transmitting information indicating

the storage position of the second data transfer information to the first processor;

transmitting, by the first processor, the data transfer device transfer start information containing information indicating the storage position of the first data transfer information and information indicating the storage position of the second data transfer information; and

by the data transfer device, reading out the second data transfer information from the second memory based on the transfer start information, reading out the first data transfer information from the third memory based on the transfer start information, and transferring the writing data from the second memory to the first memory based on the first data transfer information and the second data transfer information; and

writing, by the disk controller into the storage volume the writing data stored in the first memory based on the write request.

14. (previously presented) A control method for a storage system including a storage controller for controlling the storage system; and

at least one disk device for storing data from said storage controller, wherein said storage controller comprises:

a channel controller for receiving a file access input/output (I/O) read-out request based on a file-name indication from an information processing device through a network, transmitting to the information processing device read-out data readout from a storage volume for storing data and outputting a block access I/O read request corresponding to the file access I/O read-out request, a disk controller for reading out the read-out data from the storage

volume based on the block access I/O read request output by said channel controller, a first memory including a cache memory for temporarily storing the read-out data transmitted/received between the channel controller and the disk controller, a data transfer network connected to said channel controller, said disk controller and said first memory, the channel controller being equipped with a first processor for outputting the block access I/O read request corresponding to the file access I/O read-out request and controlling the first memory, a file access circuit which has a second processor and a second memory for controlling the second processor and receives the file access I/O read-out request from the information processing device, a data transfer device for controlling the data transfer between the first memory and the second memory, and a third memory controlled by the first memory, which are formed on a circuit module, said control method comprising the steps of:

writing, by the disk controller, into the first memory the read-out data readout from the storage volume based on the read request;

writing, by the first processor, into the third memory first data transfer information containing information indicating the storage position of the read-out data in the first memory;

by the second processor, writing into the second memory-second data transfer information containing information indicating the storage position of the read-out data in the second memory and transmitting information indicating the storage position of the second data transfer information to the first processor;

transmitting, by the first processor, to the data transfer device transfer start information containing information indicating the storage position of the

first data transfer information and information indicating the storage position of the second data transfer information;

by the data transfer device, reading out the second data transfer information from the second memory based on the transfer start information, reading out the first data transfer information from the third memory based on the transfer start information and transferring the read-out data from the first memory to the second memory based on the first data transfer information and the second data transfer information; and

transmitting, by the second processor the read-out data stored in the second memory to the information processing device.